

### **Amendments to the Claims**

This listing of claims will replace all prior versions in the application:

1. (previously presented) An apparatus for capturing an analyte comprising:  
an electrophoresis cassette comprising:  
    a base comprising a pair of electrode channels, a barrier interposed between the electrode channels, the barrier comprising at least one migration channel extending between the electrode channels, an enlarged slot adjacent to and opening into the migration channel;  
    a first electrode extending in the first electrode channel; and  
    a second electrode extending in the second electrode channel; and  
a capture gel holder receivable in the enlarged slot, the capture gel holder comprising an opening aligned with the migration channel.
2. (previously presented) The apparatus of claim 1 wherein the barrier comprises a second enlarged slot adjacent to and opening into the migration channel for receiving the capture gel holder.
3. (previously presented) The apparatus of claim 2 further comprising an evaporation cover for overlying the electrophoresis cassette, the evaporation cover comprising at least one opening for the capture gel holder and at least one opening for venting of gas.
4. (previously presented) The apparatus of claim 3 wherein the electrophoresis cassette comprises at least one wash well.
5. (previously presented) The apparatus of claim 3 wherein at least one of the electrodes has a pair of terminals that extend through the evaporation cover and are flush with the top of the evaporation cover.

6. (previously presented) The apparatus of claim 3 wherein the capture gel holder comprises a plurality of teeth, each tooth comprising an opening for receiving non-conductive polymeric mesh and the teeth comprising a polarity device so that the teeth fit in the enlarged slot of the electrophoresis cassette in a selected orientation.

7. (previously presented) The apparatus of claim 4 wherein the gel capture holder comprises a plurality of teeth, each tooth comprising an opening for receiving non-conductive polymeric mesh and the teeth comprising a polarity device so that the teeth fit through the at least one opening of the evaporation cover.

8. (previously presented) An apparatus for capturing an analyte comprising:  
an electrophoresis cassette comprising:

a base comprising a pair of electrode channels, a barrier interposed between the electrode channels, the barrier comprising at least one migration channel extending between the electrode channels, an enlarged slot adjacent to and opening into the migration channel;

a first electrode extending in the first electrode channel; and

a second electrode extending in the second electrode channel;

a capture gel holder receivable in the enlarged slot, the capture gel holder comprising an opening aligned with the migration channel; and

a thin gel carried in the opening of the capture gel holder, the thin gel comprising a gel matrix and a ligand covalently bound to the gel matrix.

9. (previously presented) The apparatus of claim 8 wherein the thin gel further comprises a non-conductive polymeric mesh for linking with the gel matrix.

10. (previously presented) The apparatus of claim 9 wherein the barrier comprises a second enlarged slot adjacent to and opening into the migration channel for receiving the capture gel holder.

11. (previously presented) The apparatus of claim 10 further comprising an evaporation cover for overlying the electrophoresis cassette, the evaporation cover having at least one

opening for the capture gel holder and at least one opening for venting of gas.

12. (previously presented) The apparatus of claim 11 wherein the electrophoresis cassette comprises at least one wash well.

13. (previously presented) The apparatus of claim 11 wherein at least one of the electrodes comprises a pair of terminals that extend through the evaporation cover and are flush with the top of the evaporation cover.

14. (previously presented) The apparatus of claim 11 wherein the capture gel holder comprises a plurality of teeth, each tooth comprising an opening for receiving non-conductive polymeric mesh and the teeth comprising a polarity device so that the teeth fit in the enlarged slot of the electrophoresis cassette in a selected orientation.

15. (previously presented) The apparatus of claim 14 wherein the capture gel holder further comprises a detection surface.

16. (previously presented) The apparatus of claim 11 wherein the gel capture holder comprises a plurality of teeth, each tooth comprising an opening for receiving non-conductive polymeric mesh and the teeth comprising a polarity device so that the teeth fit through the at least one opening of the evaporation cover.

17. (previously presented) A capture gel holder comprising:  
a handle;  
a plurality of teeth projecting from the handle, at least one of the teeth comprising a bore through the tooth; and  
a gel matrix and a ligand covalently bound to the gel matrix overlying the bore.

18. (previously presented) The capture gel holder of claim 17 wherein at least one tooth comprises a keyed shape adapted to fit in the electrophoresis cassette only in a specific direction.

19. (previously presented) The capture gel holder of claim 18 wherein each of the teeth

comprises a recessed central region around the bore and a flange on the bore and wherein the recessed region and the flange are capable of facilitating the release of gas.

20. (previously presented) The capture gel holder of claim 19 further comprising a non-conductive polymeric material overlying each bore of the teeth and for supporting the gel matrix and ligand.

21. (previously presented) The capture gel holder of claim 20 wherein the keyed shape includes each tooth having a curved edge and a flat edge adapted to fit in the electrophoresis cassette only in a specific direction.

22. (previously presented) The capture gel holder of claim 21 wherein the keyed shape includes one tooth having a protrusion adapted to pass through only a specific slot in an evaporative cover of an electrophoresis cassette.

23. (previously presented) The apparatus of claim 21 wherein the capture gel holder further comprises a detection surface.

24. (previously presented) The apparatus of claim 20 wherein the keyed shape includes one tooth having a protrusion adapted to pass through only a specific slot in an evaporative cover of an electrophoresis cassette.

25-29. (cancelled)

30-32. (canceled)

33. (currently amended) ~~The~~An apparatus of claim 32 for capturing an analyte, the apparatus further comprising  
a material comprising pores, wherein the material supports a gel matrix and a ligand covalently bound to the gel matrix;  
a capture gel holder comprising a plurality of openings for receiving the material; and

an electrophoresis cassette for receiving a gel for electrophoresis and capturing an analyte, the electrophoresis cassette comprising

a base comprising a pair of electrode channels, a barrier interposed between the electrode channels, the barrier comprising at least one migration channel extending between the electrode channels,

an enlarged slot adjacent to and opening into the migration channel for receiving the capture gel holder;

a first electrode extending in the first electrode channel; and

a second electrode extending in the second electrode channel.

34. (previously presented) The apparatus of claim 33 wherein the barrier comprises a second enlarged slot adjacent to and opening into the migration channel for receiving the capture gel holder.

35-36. (canceled)

37. (currently amended) ~~The~~A method of capturing of the target molecule of claim 35 ~~further contained in a sample, the method~~ comprising the steps of:

passing the sample into a gel matrix, wherein a material comprising pores supports the gel matrix and a ligand covalently bound to the gel matrix, such that the target molecule is captured by the ligand;

providing an electrophoresis cassette comprising a migration channel extending between a pair of electrode channels, each comprising an electrode;

providing an electrophoretic matrix in the electrophoresis cassette and forming a sample-well to receive the sample within the migration channel;

inserting the material supporting the gel matrix comprising the covalently bound ligand which is carried by a capture gel holder into the migration channel by placing the capture gel holder into an enlarged slot which is adjacent to and opens into the migration channel;

inserting the sample with the target molecule in the sample well; and

passing a voltage in the electrophoresis cassette to cause the sample to migrate in the channel from the sample well towards the material.

38. (previously presented) The method of claim 37 further comprising the steps of:  
removing the capture gel holder from the electrophoresis cassette; and  
placing the capture gel holder in a reader to detect a probe associated with the analyte.

39. (previously presented) The method of claim 38 wherein the electrophoresis cassette comprises a second enlarged slot for a respective migration channel for receiving the capture gel holder.

40. (previously presented) The method of claim 37 further comprising the steps of:  
removing the capture gel holder from the electrophoresis cassette; and  
subjecting the capture gel holder to conditions sufficient to break the bond between the ligand and the target molecule.

41. (previously presented) The method of claim 40 wherein the electrophoresis cassette comprises a second enlarged slot for a respective migration channel for receiving the capture gel holder.

42. (previously presented) A method of detecting a target molecule comprising the steps of:

providing a capture gel holder comprising a non-conductive polymeric material supporting a gel matrix comprising a covalently bound ligand;  
providing an electrophoresis cassette comprising a migration channel extending between a pair of electrodes and a sample well to receive the sample within the migration channel and a pair of enlarged slots adjacent to and opening into the migration channel;  
inserting the sample with the target molecule in the sample well;  
inserting the capture gel holder into one of the pair of enlarged slots in the migration channel;  
passing a voltage in the electrophoresis cassette to cause the sample to migrate in the migration channel from the sample well towards the non-conductive polymeric material;

removing the capture gel holder from the electrophoresis cassette; and  
placing the capture gel holder in a reader to detect a probe associated with the  
analyte.

43. (previously presented) The method of claim 42 further comprising the steps of:

preparing the sample including having a reporter probe to adhere to the target  
molecule;

stopping the voltage in the electrophoresis cassette;

moving the capture gel holder to a wash station

inserting the capture gel holder into the other enlarged slot in the migration  
channel; and

passing a voltage through the electrophoretic matrix in the electrophoresis cassette  
to cause the sample to migrate in the channel from the sample well away from the capture  
gel holder and the non-conductive polymeric material.

44. (previously presented) A method for performing an analyte ligand binding assay, said  
method comprising the steps of:

a.) providing an electrophoresis cassette comprising

a base unit comprising a pair of electrode channels, a barrier interposed  
between the electrode channels, the barrier comprising at least one migration  
channel extending between the electrode channels, an enlarged slot adjacent to  
and opening into the migration channel for receiving the capture gel holder;

a first electrode extending in the first electrode channel;

a second electrode extending in the second electrode channel;

a sample-well forming comb removably seated in the migration channel;

and

a thin gel comprising a gel matrix and a ligand covalently bound to the gel  
matrix and placed in the migration channel;

b.) filling the apparatus with a gel for electrophoresis;

c.) allowing the gel to solidify;

d.) removing the comb to thereby create a sample well;

e.) placing a sample in the sample well;

- f.) providing an electromotive force; and
- g.) moving the sample through said thin gel with said electromotive force.

45. (previously presented) The method of claim 44 further comprising the step of providing a detection probe in said sample well.

46. (previously presented) The method of claim 44 further comprising the steps of: g.) removing said thin gel from said apparatus and h.) detecting the presence or absence of said detection probe.

47. (previously presented) The method of claim 46 further comprising the step of washing said thin gel between steps g.) and h.).

48. (currently amended) An apparatus for capturing a target ~~molecular~~ molecule comprising:

a housing comprising:

a base comprising a first electrode channel and a second electrode channel,

a barrier interposed between the first electrode channel and the second electrode channel, the barrier comprising at least one migration channel extending between the first electrode channel and the second electrode channel,

an enlarged slot adjacent to and opening into the migration channel;

a capture gel holder comprising an opening aligned with the migration channel; and

a gel carried in the opening of the capture gel holder, the thin gel comprising a gel matrix and a ligand covalently bound to the gel matrix.

49. (previously presented) The apparatus of claim 48, wherein said apparatus further comprises a first electrode extending in the first electrode channel and a second electrode extending in the second electrode channel.

50. (previously presented) The apparatus of claim 48 wherein the gel further comprises a non-conductive polymeric mesh for linking with the gel matrix.

51. (previously presented) The apparatus of claim 50 wherein the barrier comprises a second enlarged slot adjacent to and opening into the migration channel for receiving the capture gel holder.

52. (previously presented) The apparatus of claim 51 further comprising an evaporation cover for overlying the housing, the evaporation cover having at least one opening for the capture gel holder and at least one opening for venting of gas.

53. (previously presented) The apparatus of claim 52 wherein the housing comprises at least one wash well.

54. (previously presented) The apparatus of claim 52 wherein at least one of the electrodes comprises a pair of terminals that extend through the evaporation cover and are flush with the top of the evaporation cover.

55. (previously presented) The apparatus of claim 52 wherein the capture gel holder comprises a plurality of teeth, the teeth comprising a polarity device so that the teeth fit in the enlarged slot of the housing in a selected orientation.

56. (previously presented) A capture gel holder comprising:

a handle;

a plurality of teeth projecting from the handle, at least one of the teeth comprising a bore through the tooth; and

a gel matrix overlying the bore.

57. (previously presented) The capture gel holder of claim 56 wherein at least one tooth comprises a keyed shape adapted to fit in the electrophoresis cassette only in a specific direction.

58. (previously presented) The capture gel holder of claim 57 wherein each of the teeth comprises a recessed central region around the bore and a flange on the bore and wherein the recessed region and the flange are capable of facilitating release of gas.

59. (previously presented) The capture gel holder of claim 58 further comprising a non-conductive polymeric material overlying each bore of the teeth and for supporting the gel matrix and ligand.

60. (previously presented) The capture gel holder of claim 59 wherein the keyed shape includes each tooth having a curved edge and a flat edge adapted to fit in the electrophoresis cassette only in a specific direction.

61. (previously presented) The capture gel holder of claim 60 wherein the keyed shape includes one tooth having a protrusion adapted to pass through only a specific slot in an evaporative cover of an electrophoresis cassette.

62. (previously presented) The apparatus of claim 60 wherein the capture gel holder further comprises a detection surface.

63. (previously presented) The apparatus of claim 59 wherein the keyed shape includes one tooth having a protrusion adapted to pass through only a specific slot in an evaporative cover of an electrophoresis cassette.

64-66. (cancelled)

67. (previously presented) The apparatus of claim 30 wherein the material comprises a mesh.

68. (previously presented) The apparatus of claim 30 wherein the ligand comprises a nucleic acid.

69. (previously presented) The apparatus of claim 30 wherein the material is non-conductive

70. (previously presented) The apparatus of claim 30 wherein the gel matrix has a tensile strength sufficient to allow removal from the apparatus.

71. (new) The method of claim 37, wherein the target molecule is detectably labeled prior to passing the sample into the gel matrix.